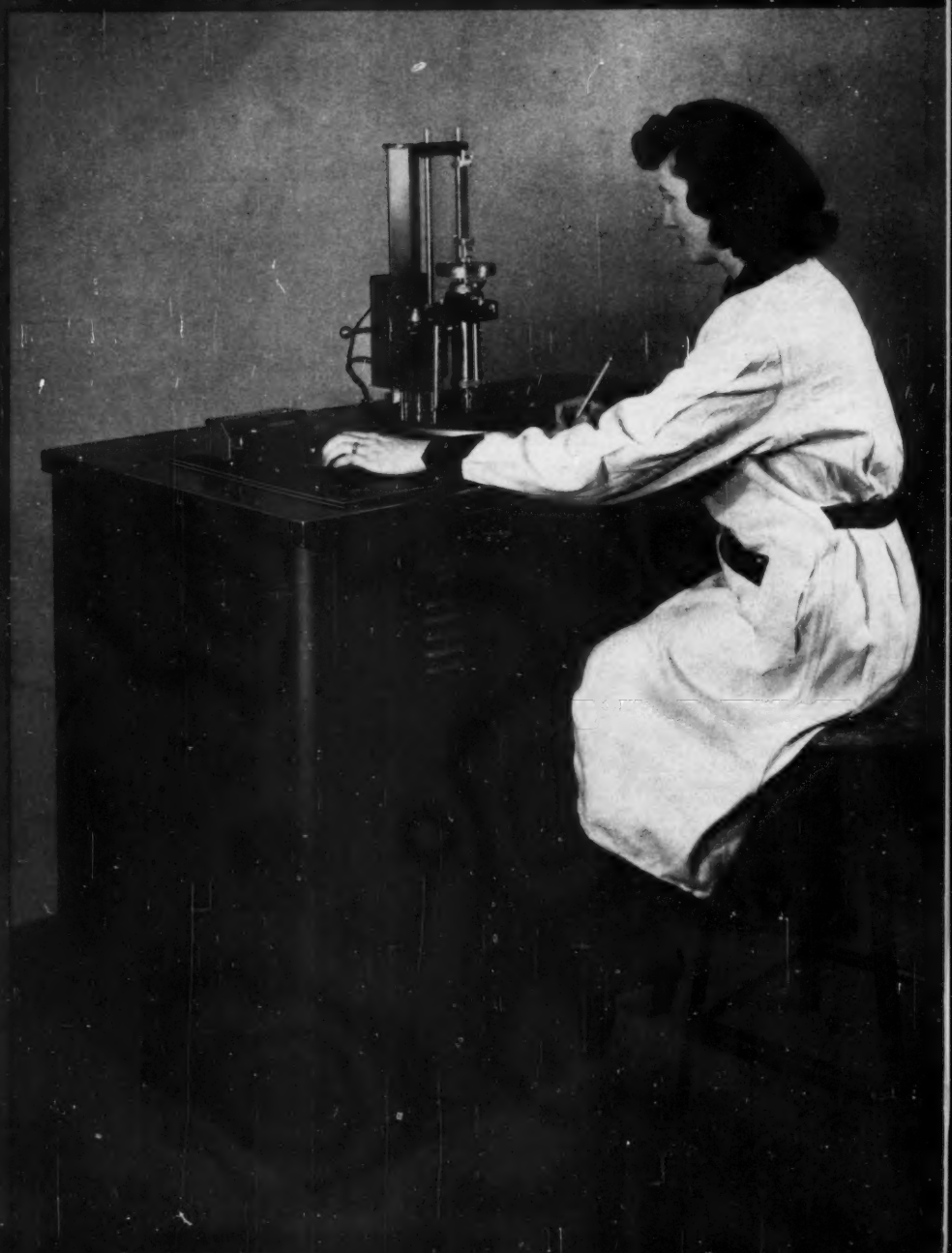
The Spokesman



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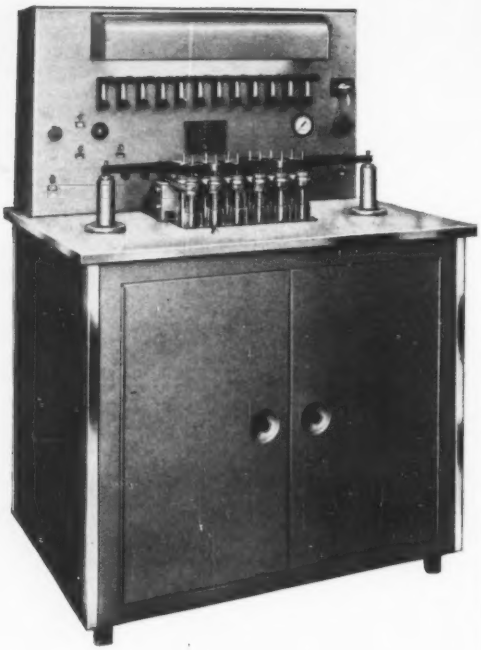

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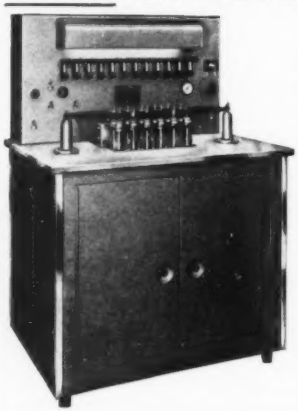

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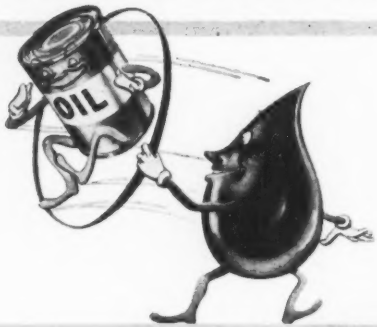

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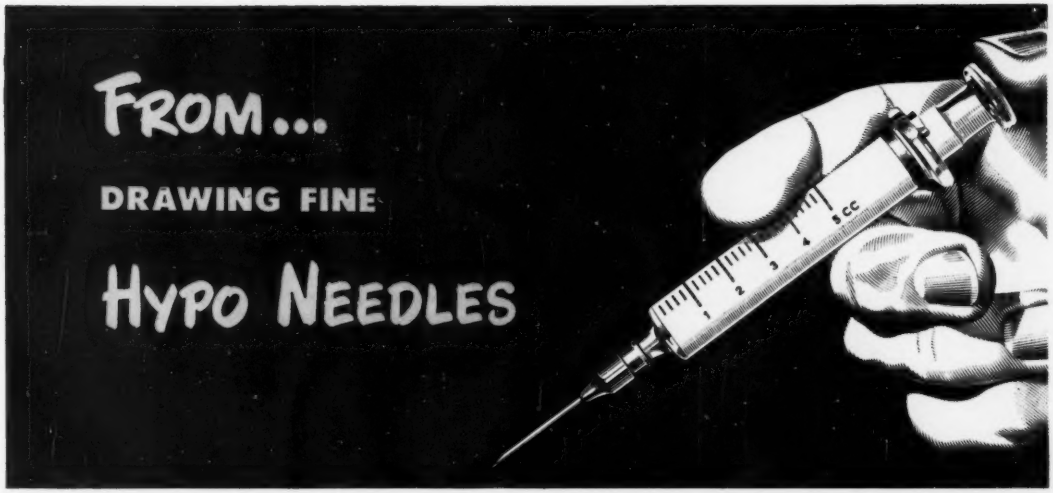

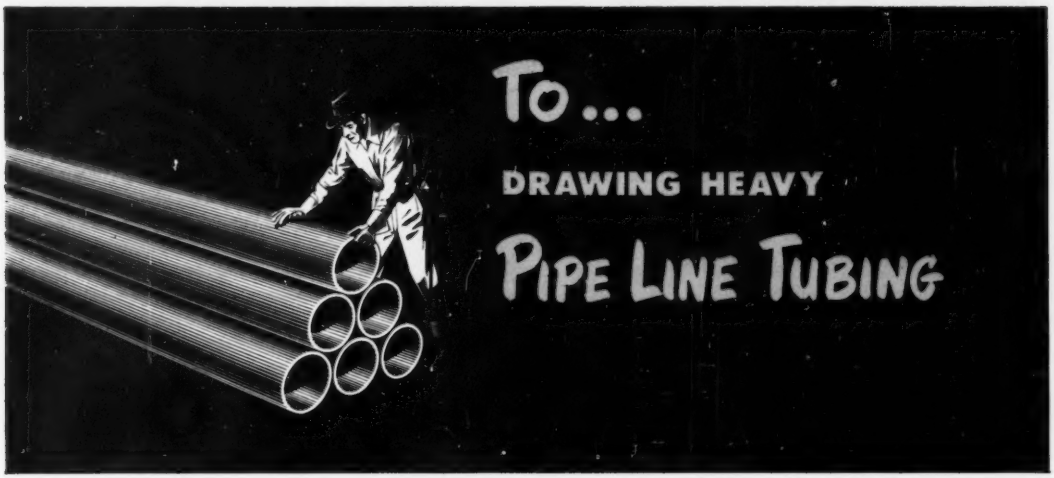

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ABOUT THE COVER . . .

The Precision-Interchemical Rotational Viscometer is a high speed, wide range instrument for investigating the rheological properties of a large variety of liquids. The viscometer measures the viscosity, plastic viscosity, yield value and thixotropic breakdown of industrial products such as paints, varnishes, oils, greases, printing inks, plastics, adhesives and hundreds of similar industrial products. The apparatus has a wide utility which encompasses numerous industrial fields, some of which are Petroleum, Chemical Processing, Foods, Paint and Varnish, Cosmetics, Printing, Drug and Rubber Industries.

The Precision-Interchemical Rotational Viscometer was developed by the Research Laboratory of the Interchemical Corporation, New York City, for measuring the viscosities of such materials as printing inks. Developmental investigation later revealed the broad scope of application.

The Rotational Viscometer is comprised of a rotating cup containing the test sample and a stationary bob immersed in the sample. The bob is suspended at the lower end of a vertical spring whose upper end is firmly clamped to a rigid arm. When the cup is rotated at a selected speed, a viscous drag is imposed on the bob causing it to twist through a maximum angle of 360° which is measured on a calibrated disk. By changing the speed of cup rotation, different torques are produced so that data for plotting a flow curve (RPM vs. TORQUE) may be obtained. The viscosity or yield value of the material is determined from the flow curve data.

The Viscometer produces consistency curves in place of the single point measurement method necessary with most viscometers. The curves can be made rapidly because the RPM can be changed instantly without stopping the instrument merely by turning a multi-contact switch.

The breakdown of thixotropic materials is obtained by plotting together an up-curve and a down-curve. The area of the hysteresis loop formed, together with the instrumental constants of speed and temperature, gives the magnitude of the breakdown. Plastics viscosities in the range of 1 to 2500 poises may be determined and yield values up to 180,000 dynes per sq. cm.

The bath provides a temperature control from room to 70° C. with a sensitivity of plus or minus 0.1° C. Four sample cups can be conditioned at one time. Forty changes in speed are possible in three minutes. In steps of 10 RPM the speed of cup rotation may be varied from 10 to 400 RPM and further, the speed may be pre-selected. The use of Thy-Mo-Trol Motor Drive, a drive control which employs electronic tubes, makes possible a smooth acceleration in cup rotation and insures a constant speed. The bob shaft is positioned by ball bearings to keep the bob in alignment and help prevent the pendulum motion common to bobs suspended from a torsion wire.

All controls are located within reach of the operator on a stainless steel table top. The housing, which encloses all rotating parts, transformers, etc., is finished in a lustrous green Hammerloid Baked Enamel.

Overall dimensions: 2 ft. 5 in. deep, 3 ft. 10 in. wide, 5 ft. 3 in. high.

President's page

by B. G. Symon, President N.L.G.I.

ANNUAL MEETINGS — PERENNIALLY AND ABSOLUTELY

One of the characteristics of our American Businessman is his intent devotion to meetings of his industry. While we of the NLGI are holding our Annual Meeting there will be hundreds of other business and professional organizations holding similar events. During the brief time you are reading this article; someone somewhere will be reading a technical paper or making a motion that his industry pursue a particular line of endeavor to make their products or services of more value to this nation and its people. Possibly that is one great contributing reason for the American businessman being the best in the entire world. His products and business system have made us an outstanding nation with the rest of the world now turning to us for aid and guidance.

The marvel of our superb products and unequalled business methods are the direct result of industry cooperation expressed through meetings so perfectly exemplified by our own Annual Meeting. Each business organization who has made a contribution toward the advancement of both our products and services presents it before his entire industry. In many cases these advancements have been determined at tremendous cost to his company. Regardless of that fact, he feels a moral obligation to his nation and contemporaries to share his progress with them. I wonder if we have become so accustomed to this free interchange, that we have become somewhat indifferent to its value to both ourselves and the people we serve.

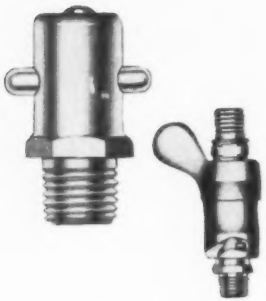
The Annual Meeting is the one opportunity we each equally share to learn the latest advancements our industry has made. Where else could such a tremendous aggregation of industry and technical leadership be met and heard? Under what other type of business system could such an event take place? None but our own. It is a typical method used by all business to bring the best that is to be offered to the service of the consumer.

During the rest of the year all of us operate with a company and product consciousness that tends to focus our activities and thinking only upon those two items. Our problems are uppermost in our minds. The other fellow has none. We attend the Annual Meeting and learn that the other chap has similar problems and he tells us how he overcame them. Then you tell him how you overcame some of his hurdles and each learns that the other fellow isn't such a bad guy after all. He becomes very much a human being like yourself with the same ambitions, frustrations and desire to help his fellow man.

That is just a small part of the story. We do learn about industry progress and swap experiences with our contemporaries; but there is more to it than these two personal aspects. Our Annual Meeting draws potential members who are inclined to join our organization and make their contribution to industry advancement, if what they see and hear there is beneficial to them. Many of our members came into the Institute because of an excellent impression gained while attending.

Among the many people attracted to our meeting are members of the press. They have always given our meetings an excellent report for our entire industry to review. Certainly they would be unable to view us and our progress under more favorable circumstances. They can, and always have, given us a most favorable impression in the eyes of our industry.

Our Annual Meeting is probably the most valuable contribution the Institute can make toward the progress of our members, the petroleum industry and the nation. It is your unselfish interest in this event that makes it possible and — an unparalleled public service.



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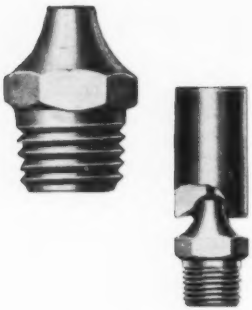

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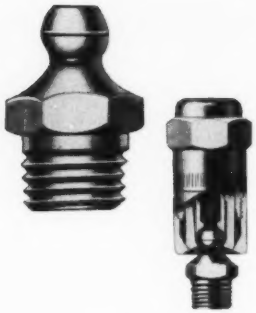

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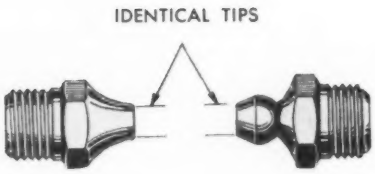

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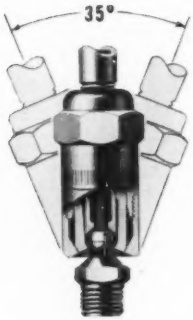

FIGURE 5

FIGURE 6

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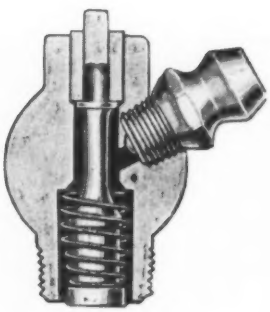


FIGURE 8

FIGURE 9

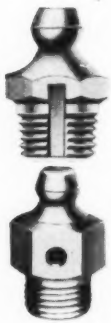


FIGURE 10
and
FIGURE 10A

EVOLUTION OF HIGH PRESSURE GREASE FITTINGS

Improvements In Grease Application

C. F. RAISCH,
Engineering Consultant,
STEWART-WARNER CORPORATION

The art of lubrication has been practiced since pre-historic days. The science of lubrication is comparatively new. It has been a gradual development that has kept pace with the progress of the Machine Age. The scientific battle against the forces of friction is a work that may never be completed because of unforeseen problems that will develop constantly in the field of mechanics.

The rapid advancements in the field of petroleum products have changed the picture completely. Since the days of "axle grease lubrication" the methods of applying grease have been constantly improved. Today, with completely mechanized equipment for handling and applying grease, machinery builders have reasonable assurance that their machines will be lubricated as specified. In fact, modern lubrication methods, devices and systems are largely responsible for the high rate of production efficiency of American industry.

The outstanding advantages of grease lubrication versus oil lubrication are well known to all. One of the greatest contributions to industry has been the ability of petroleum product makers to extend the lasting qualities of grease. Thereby it has been possible to eliminate or reduce machine shut-down periods for lubrication.

There are four general classifications of grease lubrication. They are:

1. By hand.
2. By grease packing.
3. By grease cups.
4. By pressure systems.

Since fluid grease lubrication methods for gear cases, etc., are comparatively simple, they have been omitted from the above classification.

Hand Methods: Hand greasing is still practiced on open gears and bearings, slides, ways, chains and wire ropes. Hand methods may require the use of a brush, swab, paddle or other suitable applicator.

Grease Cups: The practical applications for grease cups are now quite limited. They are primarily used on slow moving bearings. They are also used where it is essential to prevent the lubricant from dripping or splashing on parts or products, and also where lubrication must be assured over extended periods with the least amount of attention. The most commonly used is the compression type or plain screw cup. Spring feed cups, in which a spring loaded plunger forces the grease into the bearing, provide a more automatic and continuous supply of grease. Some types of grease cups are equipped with fittings for reloading with a grease gun.

Grease Pack: Sometimes enclosed bearings may be grease packed. Ball and roller bearings are commonly lubricated in this manner. Mechanical bearing packers are available for this purpose.

Pressure Application: The first high pressure greasing system was originated by Alemite in 1918[1] with the introduction of the Pin Type Fitting (Figure 1). It was immediately accepted by the Automotive industry because of the unsatisfactory performance of grease cups. The main fault with the grease cup system on cars was that the screw cup pressure was not sufficient to force dirt out of the bearing. It would not free the bearing from rust and the accumulation of caked lubricant. It was already an established fact that grease was the best type of lubricant for such bearings because oil fillers could not be retained in the bearings, particularly on moving parts of the car. Acceptance of the Pin Type system for industrial machines followed at a somewhat later date.

The original pin type fitting, together with an easily attached bayonet coupler, was the first practical step in servicing such bearings when they were properly equipped with this fitting. With this system it was possible to develop pressures up to 1,000 pounds by means of a screw type "compressor" which contained from 4 to 16 ounces of lubricant. This enabled the user to lubricate the bearings on the automobile and in a very short time all the car factories installed such fittings on their cars and furnished a small hand gun with the car.

Shortly after the introduction of this pin type fitting a "push type" fitting (Figure 2) was developed to be used in conjunction with a so-called push gun or "Zerk" gun which was applied to the top of the fitting. The seal was obtained by the pressure and contact of the nozzle of the gun on the top edge of the fitting. This system had many advantages over the pin type fitting in that no flexible hose was necessary as in the pin type compressors, and the quick application of the nozzle on the fitting made the system very popular. However, one disadvantage of this push system was the fact that if the fitting was nicked or damaged a metal to metal seal could not be maintained and the maximum pressure at which grease could be forced through the fitting into the bearing was limited to about 2,000 pounds.

In the meantime power equipment operated by air cylinders or electric motors had been developed for use with the pin type system. Such power pumps or guns were capable of building pressures up to 5,000 pounds. The pin type fitting seal very successfully withstood these high pressures, but a flexible hose was necessary between the gun and the coupler to make it possible to connect onto the fitting. In other words, the pin type system lacked the advantage of angularity of contact that the push type system provided.

The "hydraulic" type fitting (Figure 3) was perfected by modifying the Zerk fitting (Figure 4). This new fitting was designed with a pressure grip type head. The gun coupler locked on the fitting and held high lubricating pressure. The force developed in the coupler caused a set of locking jaws to grip the fitting. By this means the advantage of angularity (Figure 5) of the fitting was obtained. At the same time the grip security of the pin type fitting was combined in this system. The immediate advantage of this development led to the adoption of the hydraulic fitting on all automobiles

[1]Patent No. 1,307,733; Filed: February 19, 1918; Issued: June 24, 1919.

and machinery in place of the use of both the push type and pin type fittings.

This hydraulic coupler was admirably suited at the same time for operation with lever type grease guns as well as push type grease guns and power operated equipment.

Many special fittings are made for widely varying plant application in size, shape and angles. Rivet, drive types and various thread types are available. Fittings may be set up in header blocks and tubing taken off to the various bearing points.

Certain heavy industrial machinery had adopted the "button head" type system (Figure 6), which was of very sturdy construction. The coupler on this system was fitted with a leather seal or rubber seal which prevented leakage and was suitable for pressures up to 5,000 pounds. This system was of higher manufacturing cost than the smaller pin or push type fittings and couplers. However, today it is used extensively on earth moving equipment, road machinery and other heavy implements.

A modification of the button head fitting in larger sizes was adopted exclusively by the railroad industry for the hard type grease used on locomotives.

Another lubricating system known as the "Dot" (Figure 7) had been introduced into textile mills on weaving and spinning machinery and had been widely used on canning machines. This fitting primarily consisted of a threaded bearing screw connection on the outside of the fitting and sealed with a leather cup on the top of the fitting. This system was of decided limited pressure and had no angularity such as the hydraulic or push type systems.

Up to fifteen years ago the car manufacturers put a hand gun in the car for the owner to use in forcing lubricant through the fittings. At the same time service stations throughout the country had purchased power operated equipment and developed a business in taking care of the greasing of cars at a fixed uniform charge, which relieved the owner of this nuisance. This practice increased by leaps and bounds. The car factories soon found that few owners used the guns they furnished with the car and very few guns are furnished today as standard equipment, with the exception of large trucks, farm tractors and foreign export vehicles.

The development and improvement of power operated equipment for service stations led to the introduction of hose reels and center lubricating stands. These units were complete departments for furnishing not only chassis fitting lubrication but also the means for pumping gear oil and permitted flushing of transmissions and differentials. The development of the hydraulic hoist was a leading factor in enabling the service station to handle quick and efficient service for the car owner. The car service stations were also required to have specialized hand guns for the purpose of dispensing special types of lubricants, such as, wheel bearing, steering gear, water pump, etc. Special styles of design and markings on the guns were developed so that the correct lubricant would be placed in each bearing on the car or truck.

The use of a pressure gun on certain items such as water pumps and wheel bearings made it necessary to develop a special lubricating fitting which would relieve pressure at a predetermined point below 100 p.s.i. This was necessary in order to avoid damage to the water pump seal or avoid the danger of bursting the casting. These fittings became known as pressure shut-off fittings (Figure 8) and are used today on water pump applications, wheel bearing units and distributor housings. It was also desired by car factories that some fitting be developed that would measure a certain small amount of lubricant to the bearing in order to avoid overlubrication in such spots as distributor shafts, brake, anchor pins and similar bearings. A suitable measuring fitting (Figure 9) is in use today for such applications, as well as in many industrial machinery bearings of similar nature.

The "Lubri-guard" fitting (Figures 10 and 10a) for industry and automotive units also provided a relief pressure type fitting. This type of fitting safeguards bearing seals on electric motors, closed gear boxes and units of similar nature. It is in extensive use today under various designs and modifications.

(A) *Hand Gun—Application Methods*: One of the simplest hand grease guns is the screw plunger type in which the turning of a "T" handle forces the grease out of the

FIGURE 11

FIGURE 12

FIGURE 13

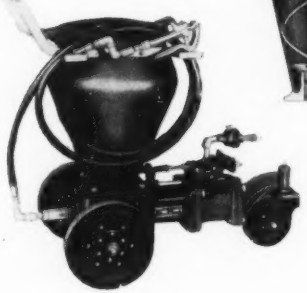


FIGURE 13A

barrel past the ball check in the fitting. Pressure as high as 1,000 pounds may be obtained.

Hydraulic Grease Guns (Figure 12): Are capable of developing pressures as high as 10,000 pounds. When the gun is pressed against the fitting the sleeve slides back on the plunger and forces a measured charge of grease into the bearing. When pressure is released the spring brings the sleeve to its forward position. Quantity of grease delivered can be varied by placing collars of different lengths between the nozzle and the shank.

Where higher pressures are required and where a heavy-bodied grease is being used, lever type grease guns with mechanical priming features, such as the "Gat-Gun" type, are used. When the lever is raised, grease from the barrel chamber is forced into the high compression cylinder. The down-stroke forces the grease into the bearing through a coupling and fitting.

Grease Gun Loaders (Figure 11): Practically all modern hand guns are provided with loading attachments so that they may be filled from the original grease container. With this mechanical loading device it is not necessary to disassemble the gun and there is no danger of getting dirt in the grease.

(B) *Bucket Pumps*: Usually 25-pound capacity. Either hand or foot operated for volume and high pressure application. They are extensively used on farms and also on road construction work and numerous industrial applications.

(C) *Power Guns*: Vast improvements have been made in power guns, both air and electrically operated. They are available in portable and stationary units to fit original containers from 25 to 400 pounds capacity. The hopper type portable units have a capacity of 25 to 40 pounds and are normally loaded by transfer pump from the original container. Some are equipped with a mechanical primer consisting of a feed screw and helicoid which forces the grease into the priming chamber of the pump. This type of gun is known as the "Rock Crusher" (Figure 13) and will handle the heaviest types of fibrous lubricants at freezing temperatures. Delivery varies from 8 to 20 ounces per minute. Grease pressure is obtainable at 40 times the air pressure applied to the pump (Figure 13A). Hilex arm and worm gear assure positive prime of heaviest greases.

The most common type of power gun is the "Barrel Pump" for dispensing grease from the original container. Deliveries vary from 8 to 50 ounces per minute and more on special equipment. Pressures vary from 20 to 60 times the air pressure. Most service station equipment develops 40 to 1 grease pressure for chassis lubrication.

Mechanical primers are incorporated in the majority of this type of gun and some lubricants can be handled at temperatures below 0° Fahrenheit. Some types of the larger sizes are equipped with a pneumatic hoist for ease of replacement of a 400-pound drum.

(D) *Centralized Lubricating Systems*: The modern trend, especially in industry, is definitely toward the use of centralized distribution systems. Their application to machine tools, presses, and other manufacturing equipment has increased by leaps and bounds because of time-saving advantages and positive operation. In general there are four types of centralized lubricating systems in use today. They are: 1—Single line terminating; 2—Single line progressive; 3—Two line terminating; 4—Two line progressive.

ABOUT THE AUTHOR

C. F. RAISCH

Received his mechanical training and a degree in mechanical engineering in Germany.

Has been active in the field of lubrication and application for nearly 24 years. First with The Bijur Lubricating Corporation and for over 20 years with the Alemite Engineering Division of Stewart-Warner, where he progressed from development engineer to project engineer and in 1941 was appointed department head of the Alemite engineering division. In 1947 he was appointed engineering consultant in which capacity he works under Mr. D. C. Peterson, Director of Engineering.

All centralized lubricating systems are either fully automatic or manually actuated. They have four things in common regardless of type or manufacturer:

1. Grease pump to supply lubricant to the system.
2. Main feed line to the dispensing valves.
3. A device for discharging a measured quantity of lubricant or dispensing valve.
4. Discharge line, hose, swivels, etc., for supplying lubricant from the dispensing valve to the bearing.

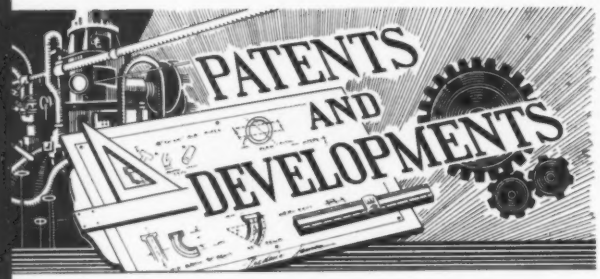
Power pumps for centralized systems are either air or electrically operated. Dispensing valves are available both fully and semi-fully hydraulic actuating. Terminating system valves normally have external indicator stems and are provided with external adjusting screws for deliveries from zero to maximum output.

The summary submitted herewith must be considered only as an outline in its broadest scope on "Improvements in Grease Application". Detailed information has been entirely omitted. Both the Grease and Equipment manufacturers have made considerable strides and no doubt have hardly scratched the surface. It should be realized that many factors must be considered in an attempt to determine the best and most economic application of any type of greasing system, as well as the proper type of lubricant of which a multitude are available.

University of Tennessee Holds Conference on Lubrication

The Conference on Lubrication under the sponsorship of the University of Tennessee, on September 29-30, convened in the Civic Auditorium at Kingsport, Tenn.

The University worked very closely with industry in bringing the two-day conference to Southeastern United States in order to benefit lubrication and safety engineers, technicians, maintenance personnel, and management representatives in manufacturing, transportation, and allied industries.



LITHIUM-ALUMINUM GREASE — A recent patent issued to Enterprise Oil Co. states that sodium base greases have the advantage of high melting points (usually over 300° F.), but are subject to emulsification and washing in presence of water. On the other hand, calcium or aluminum base greases are resistant to emulsification or washing, but have quite low melting points (about 200° F.). A complex lithium-aluminum fatty acid soap grease has been developed which has both of the desired characteristics. The complex bases are made by reacting an aluminum stearate, preferably an aluminum mono-stearate with lithium hydroxide or by reacting aluminum and lithium hydroxides with a fatty acid or hydrogenated fish oil.

The aluminum stearate, lithium hydroxide mono-hydrate, water and a portion of mineral oil about equal in weight to the aluminum stearate, are charged into the kettle and temperature slowly raised to about 300° F. when the balance of mineral oil is added slowly and heating continued slowly until 400° is reached and the temperature is maintained for 1-3 hours, after which it is cooled and worked.

One formula given, in parts by weight, is aluminum monostearate 400, water 250, lithium hydroxide monohydrate 48.7, and 300 sec. S.S.U. at 100° F. mineral oil 5300. The soap content is about 7.1%, and the properties given are: Worked consistency (D-217) 259, Dropping point (D-566) 368° F., 0.3% free acid, smooth, glossy, unctuous, non-bleeding appearance. The most effective Lithal soap bases are made by reacting 1 mole Al monostearate and 1 mole lithium hydroxide. The so-called strip test for emulsification is described.

The Lithal soaps comprise 6-9% of the finished grease, compared to 9-13% in the case of lithium greases (U.S. 2,477,296).

HIGH TEMPERATURE METAL ADHERENT GREASES—A grease designed to resist high temperatures and adhere to metal surfaces in presence of moisture, is disclosed in a patent to Standard Oil Development Co. Use is made of certain carbon blacks to impart a grease-like structure to lubricants. These "structural" carbon blacks are exemplified by the acetylene blacks and the channel blacks of the smaller particle sizes. When such carbon blacks are incorporated in a lubricating oil, they impart a colloidal structure to the composition which is quite similar in many respects to the well-known grease structure imparted by soaps. Channel blacks are particulate and their grease structure-forming properties depend on their high oil absorption due to small particle size. Acetylene black is reticulate in particle structure and has abnormal oil absorptive and structure forming properties. The acetylene blacks appear in the form of groups of particles in branched chains giving a reticulate or lacy structure which can be detected by means of the electron microscope and which is particularly suitable for the setting up of a good grease structure. Monarch 71, a typical ink black, is an example of a structural acetylene black.

A grease compounded of a mineral oil (e.g., a mid-continent base oil of viscosity 180 S.S.U. at 210° F., when mixed with a structural carbon black, forms a good grease, but lacks adhesive qualities which can be improved by addition of polyisobutylene. The latter tends to break down under shearing action, so that addition is made of petroleum hydrocarbon resins obtained from propane extraction of deasphaltized petroleum oil residua, which are good tackiness agents and impart excellent cohesiveness, and adhesiveness. Sulfur is apparently added as a break-down inhibitor for the polyisobutylene.

A typical formula for a satisfactory grease is: Acetylene black 12%, flowers of sulfur 2%, polyisobutylene (60,000-80,000 m.w.) 1%, petroleum resin from bright stock 20% and conventionally refined Mid-Continent oil of 180 S.S.U. 65%. (U.S. 2,477,311).

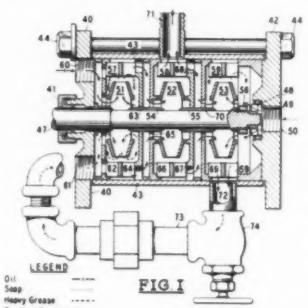


FIG I

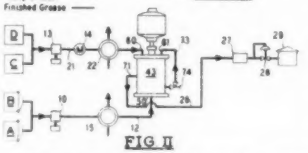


FIG II

GREASE MIXING DEVICE — California Research Corp. has been issued a patent on a fluid mixing device adapted to receive fluids of different physical characteristics, such as viscosity, shear strength, consistency, etc. It involves a multi-stage mixer having separate inlets for fluids of different characteristics, the mixing being done in sequence and including the provision for circulating an intermediate component from one stage in the sequence to another stage in the sequence, thus producing continuous mixtures or blends at a more economical and rapid rate than hitherto possible. (See Figures I and II.)

Rotating shaft 47 carries a number of shrouded impellers 51, 52 and 53 of the type generally used in centrifugal pumps, these impellers rotating in interconnected chambers in which are mounted diffusion vane assemblies 57, 58 and 59. The first component is fed in through opening 50 while other components may be fed into openings 60 and 61. The outlet for the finished component is pipe 71, while pipe 72 is the recirculation outlet. A flow sheet for blending components A, B, C, and D by means of this unit 43, is shown in Figure II. M is a meter, while 15 and 22 are heaters.

NEW GREASE PRODUCTION UNITS—Standard Oil Co. of California has undertaken a multi-million dollar modernization program including a large grease plant of over 20,000,000 lbs. per year capacity, producing over 200 greases at Richmond (Chem. Engrg. 8/49, p. 196.).

FLOW PROPERTIES OF CALCIUM SOAP DISPERSIONS IN OILS—Flow properties of dispersions of calcium soaps in hydrocarbon oils were studied in Canada over a temperature range of 35°-90° C. and rates of shear from 500 to 16,000 sec. —1 by extrusion through a capillary plastometer. The thixotropy of the system falls as the temperature is increased to 50° C. and then rises to a maximum at 65° C., after which it falls regularly. The behavior is due to the thermal weakening of the thixotropic bonds, followed by a strengthening of these bonds due to incipient swelling on the surface of the soap. As the surface of the soap particles continues to swell, cohesion of the particles increases to such an extent that breakdown does not take place and the coefficient of thixotropy falls to very small values. The coefficient of thixotropy found by this method bears a linear relation to the hardness of the dispersion as determined by a falling cone (Moses *et al*, Can. J. Res. 7/49, p. 616B).

MICROWORKER FOR GREASES—A device for intensive mixing and shearing of relatively small quantities of colloidal dispersions, such as lubricating greases, is covered in a patent to Geo. M. Hain of Montclair, N. J. It comprises a pair of small, hollow cylinders, a plunger for each cylinder, a discharge tip on each cylinder provided with a passageway communicating with the interior of the cylinder, a worker section adapted to connect the discharge tips together, and holes disposed transversely in the passageway to effect the shearing action (See Figure III) (U.S. 2,477,598).

FOREIGN PATENTS AND APPLICATIONS — Brit. Appl. 17,914/49 (Standard Oil Dev.)—Alkaline earth metal soap grease; Brit. Appl. 18,474/49 (Shell Oil)—Lubricating grease; Brit. Appl. 18,505/49 (Standard Oil Dev.)—Lubricating greases.

Books and Publications

. . . *About the Industry*

LUBRICATION OF INDUSTRIAL AND MARINE MACHINERY.

By the late WILLIAM G. FORBES. 1943. 319 pages. Illustrated. 5⅝ by 8⅝. Cloth $4.00

The general principles of lubrication are developed in brief, clear, and not-too-technical terms. The first few chapters provide a working knowledge of distillation, refining, blending, cracking, and petroleum chemistry; these are followed by a description of the various laboratory tests remaining, and major portion of the book is devoted to practical discussions on the lubrication of prime movers and machinery.

CONTENTS—Distillation. Distillation of Lubricating Oils. Chemistry of Petroleum. Refining Light Distillate and Lubricating Oils. Blending. Dewaxing and the Effect of Wax in Lubricating Oils. Compounding. Tests and Specifications. Purchase Specifications. Effect of Heat and Pressure on Lubricating Oils. Effect of Metals on Lubricating Oils. Bearing Lubrication and the Formation of Oil Films. Methods for Applying Lubricants. Ball and Roller Bearings. Steam Engines. Steam Turbines. Hydraulic Turbines. Air Compressors and Vacuum Pumps. Pneumatic Tools. Refrigerating Machines. Gas Compressors. Internal Combustion Engines. Gasoline Engines. Diesel Engines. Reduction Gears. Machine Tools. Steel Mills. Heat-Treating Oils. Paper Mills. Textile Machinery. Wire Ropes and Cables. Hot Oil Circulating Systems. White Oils. Oil Purification and Reclaiming. Greases. Rust Prevention with Petroleum Products. Appendix. Index.

THE CHEMICAL CONSTITUTION OF NATURAL FATS.

By T. P. HILDITCH, Campbell Brown Professor of Industrial Chemistry, University of Liverpool. 1940. 438 pages. 11 illustrations. 6⅛ by 10⅛. Cloth $7.50

The discussion in this book is designed to develop as completely as possible the interrelationships of the natural fats as a group of naturally occurring organic compounds. The treatment is primarily from the standpoint of their chemical constitution. Because of the close connection which has been discovered to exist between the component acids in a fat and its biological source, the author has classified the fats along biological lines.

THE CHEMISTRY OF PETROLEUM DERIVATIVES.

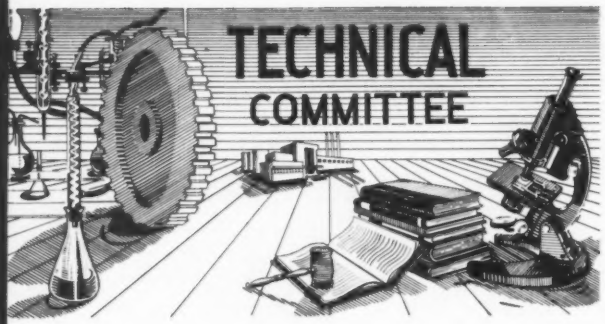
By the late CARLETON ELLIS, formerly Industrial Research Chemist. Volume I, 1285 pages, 48 figures, $20.00; Volume II (Supplementary), 1464 pages, 350 illustrations $22.50

"The book in its 1285 pages is a veritable encyclopedia and the mass of material concerned with the development and utilization of the derivatives of natural gas and petroleum will be indispensable to technologists. It really stands in a definite class by itself by reason of its extraordinary comprehensiveness . . . Frequently a reviewer, impressed with the authoritative way in which a book before him has been produced, is inclined to say 'This work is indispensable.' In no case within your reviewer's knowledge is that statement more true than in Carleton Ellis's stupendous compilation." — A. E. Dunstan, in Chemistry and Industry.

THE CHEMICAL PROCESS INDUSTRIES.

By R. NORRIS SHREVE. Chemical Engineering Series. 957 pages. 5¾ by 8¾. 256 illustrations. 1945. $8.00

CONTENTS—Objectives. Unit Processes and Unit Operations. General Fundamentals. Water Conditioning and Wastewater Treatment. Fuels, Power, and Air Conditioning. The Destructive Distillation of Coal. Fuel Gases. Industrial Gases. Industrial Carbon. The Ceramic Industries. Cements, Calcium and Magnesium Compounds. Glass Industries. Potassium Salts and Mixed Fertilizers. Salt and Miscellaneous Sodium Compounds. Soda Ash, Caustic Soda, and Chlorine. Electrolytic Industries. Electrothermal Industries. Phosphorus Industries. Sulfur and Sulfuric Acid. Nitrogen Industries. Hydrochloric Acid and Miscellaneous Inorganic Chemicals. Explosives, Pyrotechnics, and Chemical Warfare. The Photographic Industry. Paint, Varnish, Lacquer, and Allied Industries. Leather, Gelatine, and Glue. Pesticides. Perfume and Flavoring Industries. Oils, Fats, Waxes. Soap and Other Surface-active Agents. Sugar and Starch Industries. Fermentation Industries. Wood Chemicals. Pulp and Paper Industries. Plastics. Natural and Synthetic Rubber. The Petroleum Industry. Intermediates. Dyes and Their Applications. Organic Chemicals Not Otherwise Classified.



Chairman T. G. Roehner, Director of the Technical Service Department, Socony-Vacuum Laboratories

The agenda for the Annual Meeting of the Technical Committee will be a reflection of the replies received from the questionnaire sent to each member on July 26, 1949, requesting information on the subjects which they regarded as of most interest. A prominent position will be given to the activities of the Panel on Delivery Characteristics of Dispensing Equipment for Lubricating Greases. It will be recalled that the Panel's objective is to develop a method for defining the operating ranges of grease dispensing equipment, particularly grease guns, in terms of physical characteristics of the greases they will handle.

There is good reason to believe that the physical characteristics of most importance in this problem are slumpability and pumpability. The former is a term coined to indicate the rate at which greases will slump in packages and feed to the pumping mechanisms, whereas pumpability refers to the rates of flow or discharge of the products from the pumps to the bearings. The former is indicated by determination of yield values, while the latter is a function of the apparent viscosity —shear rate relationships of the greases. The merits of this approach to the problem were enhanced by the recent decision of ASTM to publish a method for the determination of yield values and apparent viscosities of greases. The activities of the Panel to-date have confirmed past experience that ASTM worked penetrations are not reliable as a basis for predicting comparative pumpabilities.

Adoption of those two tests as a means for defining physical characteristics will make it unnecessary to refer to the compositions of the greases. Moreover, the program of the Panel does not require reference to details of the design of the grease pump.

The amount of work already completed by the Panel is much greater than would be suspected from the reports issued to-date. In their first series of tests, seven members worked on three greases, which were run in five guns at three temperatures (room temperature, 50° F. and 32° F.), and at two pressures (90 and 150 p.s.i.). The data from those tests have been summarized and will be presented at the forthcoming annual meeting. The second series of tests, the conditions of which were guided by the experience obtained with the first, has been under way for some time and the Panel's report will include information regarding the test conditions. This program represents a cooperative effort of two groups, namely, grease dispensing equipment and grease manufacturers, on a single problem of obvious interest to the consumer. The problem is extremely difficult and there is considerable work still to be done. It is hoped that the Panel will receive further encouragement from the discussion of their report in New Orleans.

Over 250 copies of the questionnaire were distributed to members of the Technical Committee and other interested personnel, in order to make certain that the agenda for the New Orleans meeting includes all the major technical subjects which are of immediate interest to the industry. The replies have been instructive and the meeting, therefore, should be interesting to all who have an opportunity to attend. Copies of the minutes will be prepared promptly and will be available for possible publication in "The Institute Spokesman".

Precision Riffle Sampler Conforms With A.S.T.M. D271 Changes

Precision Scientific Company has designed a new Small Riffle Sampler to conform with A.S.T.M. D271 — which has also been accepted as an American Standard by the American Standards Association. The sampler is the first to be made in accordance with the most recent changes in A.S.T.M. D271.

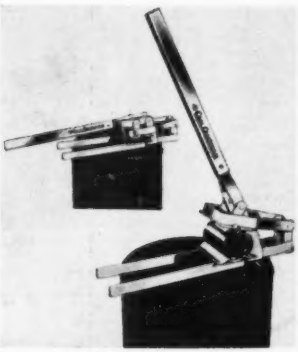
While it was designed for the accurate sample splitting of coal and coke for laboratory analysis, the sampler also has a wide acceptance for the laboratory sample reducing of all granular or powdered materials such as ore, sand, cement and chemicals. Precision's Small Riffle Sampler is the most accurate sample splitter made.

Sampling accuracy is promoted by having a dust tight case since keeping the dust with the sample gives more representative results. This feature lessens annoyance to the operator and aids in keeping the laboratory clean. Large door panels provide easy accessibility and are kept dust tight by a continuous piano hinge at the top and a sturdy cabinet lock at the bottom.

All surfaces, both inside and out, are covered in an attractive brown Hammerloid, a tough acid and alkali-resistant baked enamel. The smoother inner surfaces prevent clinging residue which could change the accuracy of the sample or adulterate the following samples. In addition, the smooth, durable finish prevents corrosion and rust which would contaminate the samples as well as make cleaning difficult.

The apparatus is strongly and simply constructed of 18 and 20 gauged sheet steel with the sections welded or belted together. The two matching drawers are of one-piece welded construction. Overall dimensions: 15 inches high, 11½ inches wide, 14 inches deep.

New Can Crusher Facilitates The Disposing of Empties



Service stations may now avoid the nuisance of accumulated empty cans by using a new Can Crusher manufactured by Geuder, Paeschke & Frey, Milwaukee, Wis. One stroke of this Can Crusher, a second's time, and the can is "flat as a pancake". No cutting off the ends, no crushing by foot or heavy weights. It takes cans up to and including one quart size, reducing them to one-fifth their former dimensions. To the filling station or garage, this means that one 55-gallon drum will hold over 500 crushed quart cans that, before crushing, would fill five or six drums. It saves space as well as hauling-away costs and helps keep the premises neat.

Stations that prefer the neatness and added profit of handling oil in cans instead of pumping it from drums, can now enjoy the advantages of canned oil without cluttering up their space with empty uncrushed cans.

No extra space is needed for the crusher as it locks itself to any size drum, garbage or ash can.

The G. P. & F. Single Stroke Can Crusher is made of heavy-gauge bar and plate steel. Overall length is 10 inches. It is painted red and the approximate shipping weight is 23 pounds. It is packed for shipping, one to a carton and priced to sell at $11.95.

N.L.G.I. Greasonalities

Western Oil Company Limited has appointed Mr. N. C. Currell manager. The head office for Western Oil is located in Moose Jaw, Saskatchewan, Canada.

Mr. D. B. Spanogle has retired recently from The Atlantic Refining Company and has been succeeded by Mr. H. B. Stone.

N. I. Malmstrom and Company announces the removal of its Chicago office from 444 West Grand Avenue to 612 N. Michigan Avenue. Complete stock is carried in the Chicago warehouse to service the midwest with immediate deliveries.

Mr. Norman B. Tichenor replaces Mr. Hall Stewart as the company representative and technical committee representative for the Prairie States Oil and Grease Company.

A N.L.G.I. Board of Directors Meeting was held September 16, Atlantic City, N. J., at the Hotel Traymore. Plans were discussed for the Annual Meeting.

A Magazine's Work Is Never Done

This month the inside back cover page has been rearranged to show off to the very best possible advantage the Associate and Technical Members of the N.L.G.I. These members lend their efforts to support the industry so the "Spokesman" is doing its part in supporting them by improving their page.

Stewart-Warner Delivers One-Package Fuel Pump

A complete one-package fuel pump department is now being delivered by the Instrument Division of Stewart-Warner Corporation, Chicago. The package, which opens to form an eye-arresting counter display, contains everything needed for any passenger car fuel pump installation.

In announcing the new fuel pump kit, George Zahn, instrument division sales manager, stated:

"Now dealers and service station operators can be in the fuel pump business with a minimum inventory. In fact, with one pump and the mounting kits, a dealer can make a pump installation on any make of passenger car."

The double-purpose shipping and counter display carton contains three electric fuel pumps, a mounting kit for Ford cars, one for Chrysler and Plymouth cars and a third for all other vehicles. Also included are all necessary terminal lugs, wire and thread-sealer. Even point-of-sale promotional material to be used with the two-color display package is included.

Foote Mineral Company Purchases New Location for Laboratory

Foote Mineral Company, Philadelphia, Pa., well-known manufacturers of lithium, strontium and tungsten chemicals; metals and alloys, ceramic and electrode coating materials and refined ores, have announced purchase of the Easttown School Building, Berwyn, Pa. Plans are under way for conversion of this three-story brick structure for scientific research and development purposes covering work carried out by their Research and Development Department. The location is well suited for this purpose, being well provided with public transportation, located in a rural environment in attractive surroundings and serviced with adequate city utilities. The building is situated in the center of a 1.6-acre plot, occupying an entire block and elevated at some distance from the Lincoln Highway. Situated between the main office of the company at Germantown, Philadelphia, Pa., and the plant at Exton, Pa., easy access is obtained with management, sales and production.

Adequate laboratories, library, shop facilities and special equipment will be provided to carry out present and future research and development programs concerned with development of new and improved products and enhancement of quality and markets for present products in the fields of chemicals, metals and alloys, welding rod coatings, ceramic glazes, enamels and bodies as well as engineering studies related to improvement in equipment design and process control.

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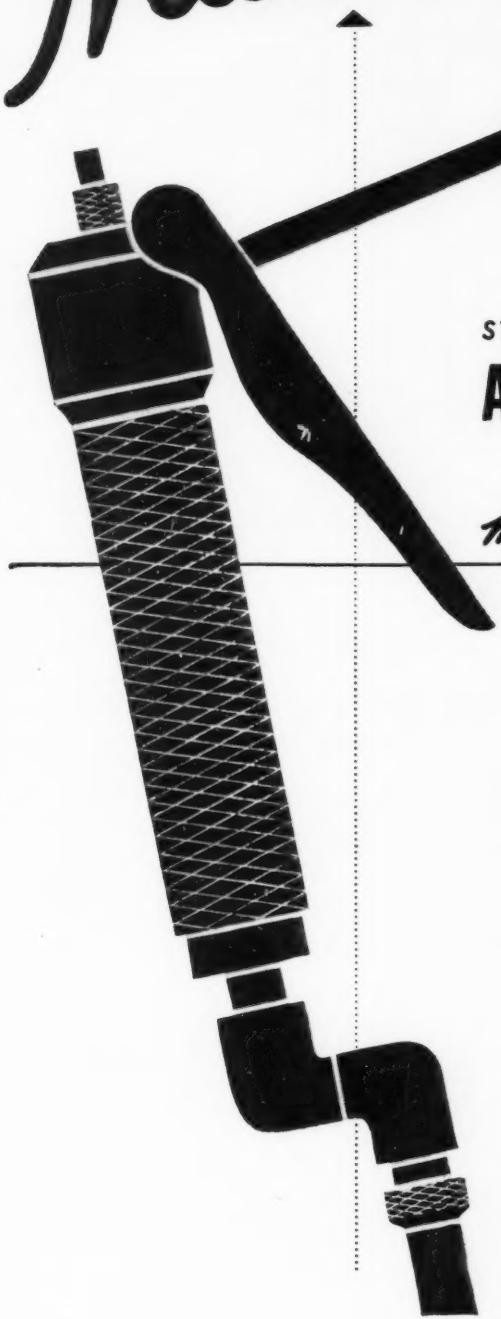

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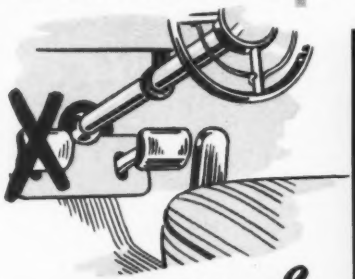

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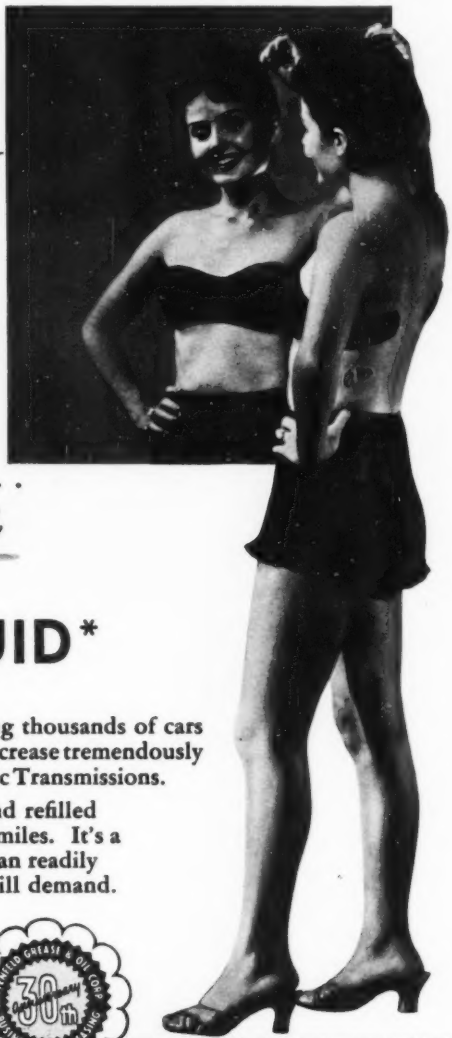

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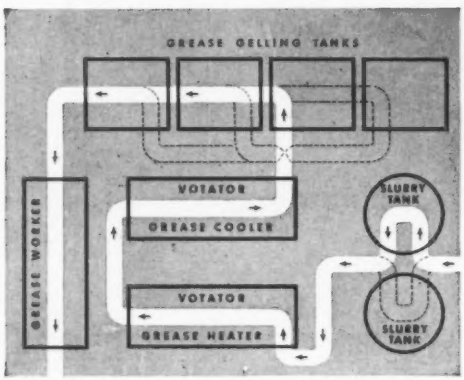

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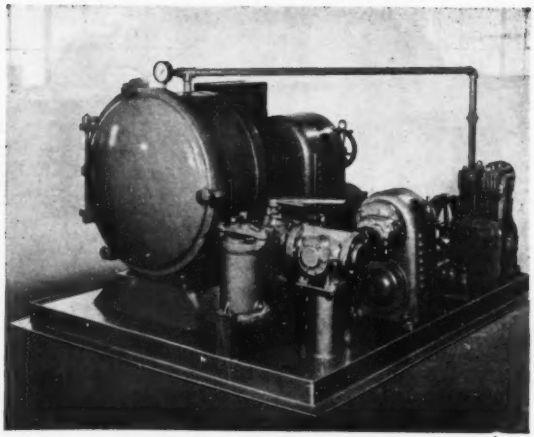

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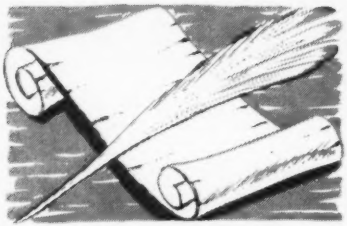

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